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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|-----------------------|---------------------|------------------|
| 10/714,528 | 11/14/2003 | Daniel F. Sievenpiper | B-4345CIP 621324-5 | 2213 |
| 36716 | 7590 | 08/11/2005 | EXAMINER | |
| LADAS & PARRY 5670 WILSHIRE BOULEVARD, SUITE 2100 LOS ANGELES, CA 90036-5679 | | | TAKAOKA, DEAN O | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2817 | |

DATE MAILED: 08/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|------------------------|------------------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/714,528 | SIEVENPIPER, DANIEL F. | |
| | Examiner | Art Unit | |
| | Dean O. Takaoka | 2817 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
 - If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
 - If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
 - Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 May 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-40 is/are pending in the application.
- 4a) Of the above claim(s) 12-14 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 1-11 is/are allowed.
- 6) ☒ Claim(s) 15,26-28,38 and 39 is/are rejected.
- 7) ☒ Claim(s) 16-25,29-37 and 40 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 May 2005 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 5/31/05
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 15 and 28 are rejected under 35 U.S.C. 102(e) as being anticipated by Chiang et al. (U.S. Patent No. 6,515,635), Applicant's prior art cited in the IDS dated August 23, 2004.

Claim 15:

Chiang et al. shows a switch arrangement comprising a plurality of MEMS switches (905 – col. 7, lines 17-19) arranged on a substrate (310) about a central point (i.e. RF signal port of switch 400 – Fig. 9), each MEMS switch being disposed on a common imaginary circle (inherent where switches 905 in Fig. 9, with respect to the 360° five element 72° arrangement in Fig. 3, and where Fig. 7 identifies $\lambda/4$ length of the switch/s to the central point 400) having a diameter which is less than one half wavelength of frequencies in a passband of the switch arrangement (where switches 905 of Chiang et al., arranged at 72° intervals comprise a diameter less than 0.5λ ; $r = .125/\sin 36^\circ$ and $d = 2r$ or $.425\lambda$); and connections for connecting an RF port of each

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one of the MEMs switches with the central point (where switch 400 provides connections of each switch 905 to central RF signal port).

Claim 28:

A method of making a switch arrangement (where the method is generic and defines or is defined by the final product, thus the final product of Chiang et al. defining or defined by the generic method) comprising disposing a plurality of MEMs switches on a substrate in a circular pattern having a diameter which is less than a half wavelength of frequencies in a passband of the switch arrangement (discussed in the reasons for rejection of claim 15 above, where switches 905 of Chiang et al., arranged at 72° intervals comprise a diameter less than 0.5λ ; $r = .125/\sin 36^\circ$ and $d = 2r$ or $.425\lambda$); disposing a plurality of RF lines (415) disposed in a radial pattern relative to the point on the substrate (Fig. 9); and connecting the plurality of RF lines to a common junction at the point on the substrate (RF signal port of switch 400 – Fig. 9; discussed in the reasons for rejection of claim 15 above) via the plurality of MEMs switches (905) where operation of one of the plurality of MEMs switches couples to one of the plurality of RF lines to the common junction.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 26 and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiang et al. in view of Sievenpiper et al. (U.S. Patent No. 6,366,254), Applicant's prior art cited in the IDS dated August 23, 2004.

Chiang et al. shows a switch arrangement comprising a plurality of MEMs switches (discussed in the reasons for rejection of claim 15 above), where the antenna array comprises well-known Yagi antennas but does not teach the antennas comprising well-known Vivaldi antennas or comprising a cloverleaf pattern.

Sievenpiper et al. (Figs. 3,4) shows a similar antenna array with switch controls comprising well-known end-fire Vivaldi antennas in a cloverleaf pattern.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the Yagi antennas disclosed by Chiang et al. with the end-fire Vivaldi antennas in a cloverleaf pattern disclosed by Sievenpiper et al. Such a modification would have realized the advantageous benefit of providing horizontal polarization with antennas having a directivity four times better than an omnidirectional antenna (Sievenpiper et al.; col. 5, lines 17-33) thus suggesting the obviousness of the modification.

Claims 38 and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chiang et al. et al. in view of Ito et al. (U.S. Patent No. 6,337,668).

Claim 38:

Chiang et al. teaches a plurality of MEMS switches arranged on a substrate about a common RF port, the RF port having a centerline (RF signal port of switch 400

– Fig. 9; discussed in the reasons for rejection of claim 15 above) and each MEMS switch being disposed spaced equidistantly from the centerline of the RF port (switches 905 in Fig. 9, with respect to the 360° five element 72° arrangement in Fig. 3, and where Fig. 7 identifies $\lambda/4$ length of the switch/s to the central point 400, discussed in the reasons for rejection of claim 15 above); and connections for connecting an RF contact of each one of the MEMS switches with the common RF port but is silent where the switches are spaced equidistantly by a length of less than one-quarter wavelength.

Ito et al. teaches a similar plural antenna array (Figs. 11 and 12) connected to switches (307 – 310) where the switches are spaced equidistantly by a length of less than one-quarter wavelength (where Ito et al. teaches the antenna elements being spaced $1/8\lambda$ – col. 4, line 32, thus where connected switches are obviously connected less than $1/4\lambda$).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have substituted the switch distance disclosed by Chiang et al. with the switch distance of less than one quarter wavelength disclosed by Ito et al. Such a modification would have been obvious to reduce the size of the antenna array, provide a high-gain antenna apparatus with directivity (Ito et al.; col. 1, line 5 to col. 2, line 4), thus suggesting the obviousness of the modification.

Claim 39:

Where the centerline of the RF port is disposed perpendicular to a major surface of the substrate (where n is perpendicular to 310 – Fig. 3).

Response to Arguments

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Applicant's arguments with respect to claims 1 – 11 and 15 – 40 have been considered but are moot in view of the new ground(s) of rejection.

Allowable Subject Matter

Claims 1 – 11 are allowed.

Claims 16 – 25, 29 – 37 and 40 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dean O. Takaoka whose telephone number is (571) 272-1772. The examiner can normally be reached on 8:30a - 5:00p Mon - Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Pascal can be reached on (571) 272-1769. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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August 8, 2005



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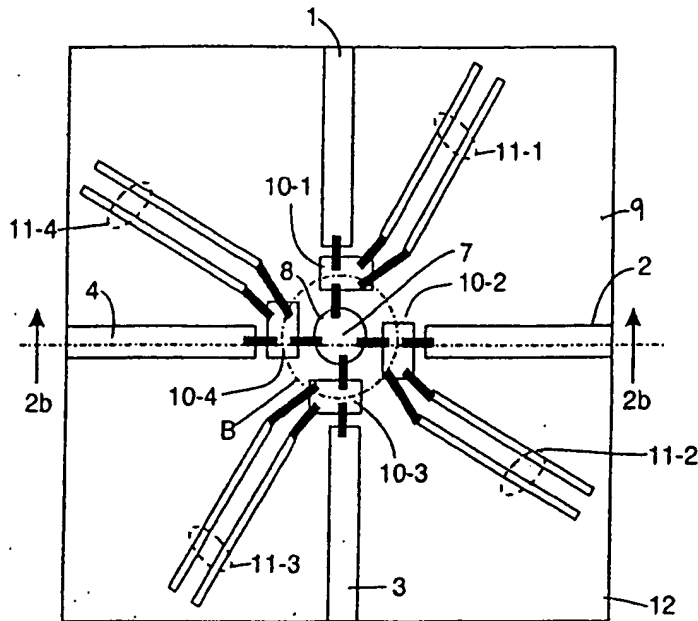


Figure 2a

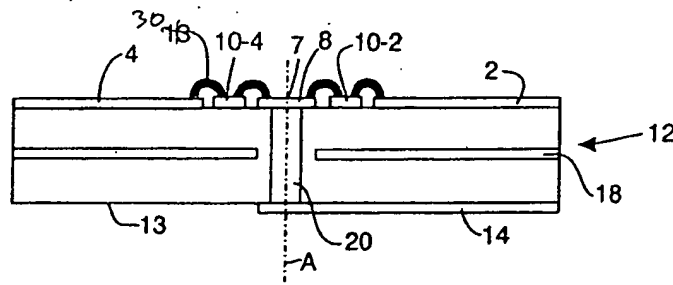


Figure 2b

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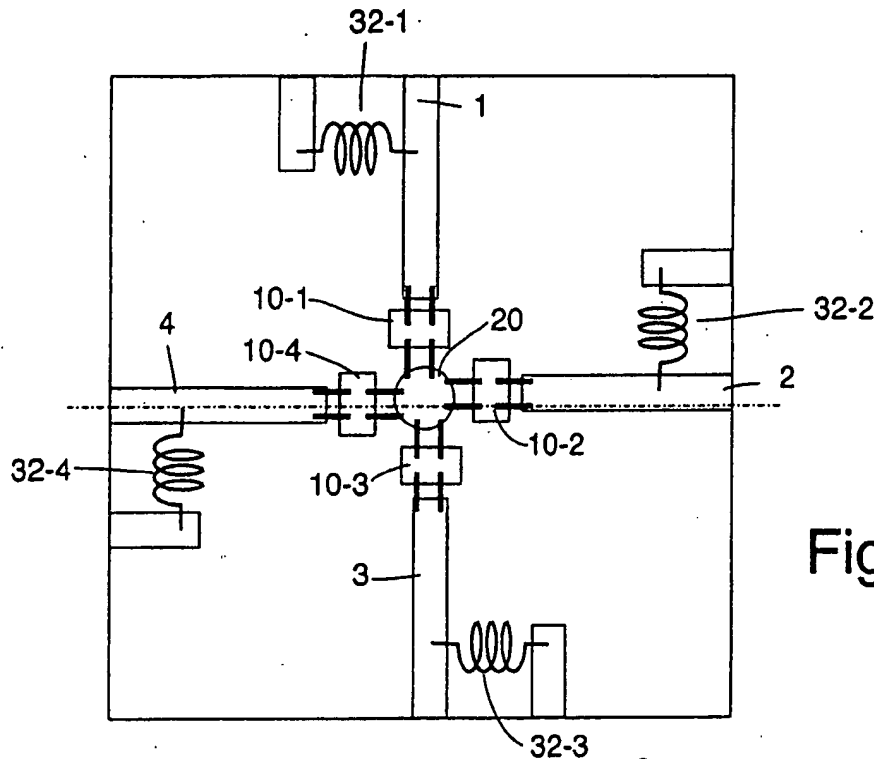


Figure 6a

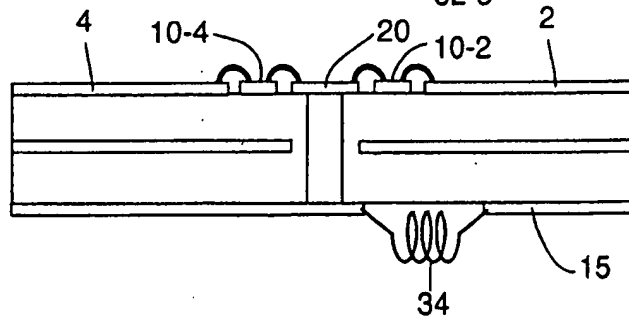


Figure 6b

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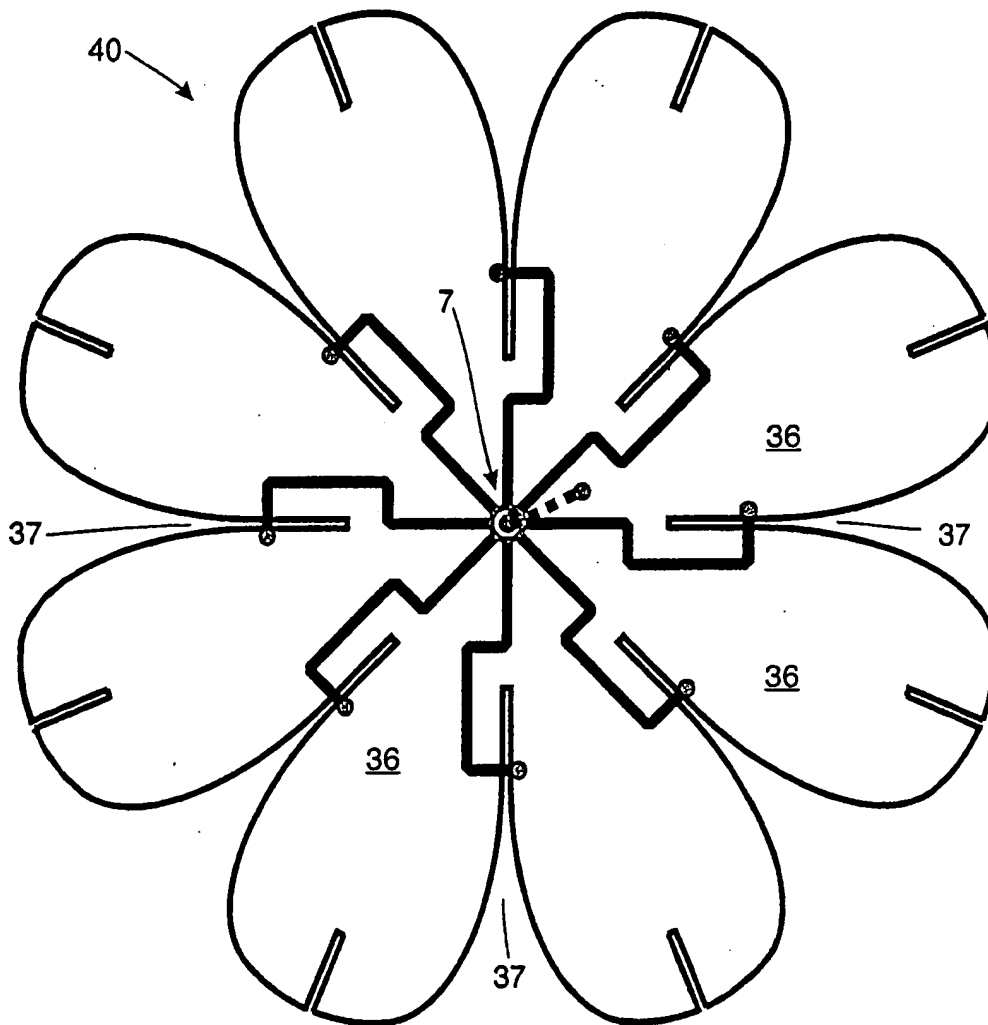


Figure 8